

[0062] FIG. 35 is an exploded perspective diagram of a touch pad, in accordance with one embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

[0063] Recently, the functionality of individual hand held devices has been converging into a single hand held device with multiple functionality. For example, music player functionality has been added to cell phones and PDAs. While combining devices has advantages, it does create some design challenges. For one, each of these devices requires a different set of input devices, and thus it becomes a non trivial problem to create an input layout that can support multifunctional devices (especially when the input devices are at fixed locations). Examples of multifunctional devices may be found in U.S. Provisional Patent Application 60/658, 777, which is herein incorporated by reference.

[0064] The invention pertains to a user interface for controlling an electronic device, particularly a multifunctional electronic device that is capable of operating in multiple modes as for example a phone mode for communications and a media player mode for playing audio files, video files, and the like.

[0065] In accordance with one aspect of the invention, the user interface includes a configurable input region for navigating, making selections and initiating commands with respect to the electronic device. The input region is configured to adjust its input areas based on mode so that the inputs being provided match the current mode of the electronic device. The input region may be widely varied and may include a touch or proximity sensing area that generates signals for one or more of the operations mentioned above when an object is positioned over a sensing surface. The sensing area is typically mapped according to mode of the electronic device.

[0066] In accordance with another aspect of the invention, the user interface also includes a display mechanism for presenting input identifiers that indicate particular locations of the input region capable of actuating inputs associated with the input identifiers. Generally speaking, the display mechanism is utilized in order to replace fixed printed graphics or indicia on or near the input region and to allow the graphical information to change or adjust in accordance with a current input mode (e.g., the graphics or indicia can be reconfigured on the fly). As such, a single input region can be utilized for multiple modes of the electronic device. The display mechanism may also be used to provide feedback associated with inputting. For example, it may be used to indicate which input area is ready for actuation (e.g., highlight).

[0067] In one embodiment, the display mechanism is configured to present graphical information proximate the input region so that it can be seen when inputs are being performed at the input region. For example, the display mechanism may be located above, below or next to the input region. In another embodiment, the display mechanism is configured to present graphical information at the input region. For example, the display mechanism may be integrated with a sensing surface of the input region. In either case, the graphics or indicia typically follows or is mapped to the desired input layout of the input region. For example, the adjustable graphics or indicia is located at the same position as their counterpart input areas of the input region.

As such, physical fixed graphics and indicia can be removed from the input region without impairing the use of the input region (e.g., the user knows how to input based on the layout of the presented graphics and indicia).

[0068] Embodiments of the invention are discussed below with reference to FIGS. 1-35. However, those skilled in the art will readily appreciate that the detailed description given herein with respect to these figures is for explanatory purposes as the invention extends beyond these limited embodiments.

[0069] FIG. 1 is a simplified diagram of a multifunctional hand held device 10, in accordance with one embodiment of the present invention. The multifunctional device is capable of operating in different modes including for example a phone mode and a media player mode (e.g., audio, video, etc.). By way of example, in the phone mode, the handheld device operates like a phone. For example, a user is able to dial a phone number, receive and send phone calls, etc. In the media player mode, the handheld device operates like a media player. For example, a user is able to traverse through lists of songs or videos, select and play a song or video from the lists of songs, and videos, etc.

[0070] In accordance with one embodiment, the multifunctional device 10 includes a single user interface 12, which is used to control the operations for each mode of the device. That is, the same UI 12 is used for multiple modes of the device 10. The user interface 12 generally includes a display region 14 and an input region 16. The location of these regions may be widely varied. In one embodiment, the display region and input region are disposed at the front surface of the multifunctional device for easy access and viewing while the device is being held in the user's hand.

[0071] The display region 14 allows the handheld electronic device 10 to interact with the user. For example, displaying a graphical user interface GUI associated with each mode. The GUI provides an easy to use interface between a user of the handheld device and the operating system or applications running thereon. Generally speaking, the GUI represents, programs, files and various selectable options with graphical images. The GUI can additionally or alternatively display information, such as non interactive text and graphics, for the user of the handheld electronic device. The display may also be used to display images or play video.

[0072] The input region 16 allows a user to interact with the hand held electronic device 10. For example, it allows a user to navigate, make selections and initiate commands into the handheld electronic device 10. In most cases, the input region 16 may be simplified so as not to clutter and confuse the user interface. For example, the input region 16 may not be complexly arranged and may include a limited number of individualized input mechanisms. In one implementation, the input region is a single integrated unit for performing a majority if not all of the inputting of the handheld electronic device (e.g., operates each mode).

[0073] In most cases, the input region 16 provides signals when touched and/or pressed. The signals generated at the input region 16 are configured to provide one or more control functions for controlling various applications associated with the hand held device 10. For example, the control functions may be used to move an object on the display, to make selections or issue commands associated with operating the various modes of the handheld device 10.